REMARKS/ARGUMENTS

Claims 1-20 are currently pending. Claims 1, 4, 9 and 11 have been amended. Claims 17-20 are withdrawn. Applicants respectfully request entry of this amendment based on the following remarks.

Rejection under 35 USC 112, second paragraph

The Examiner rejected claims 4 and 11 as being indefinite due to lack of proper antecedent for the term "the expression vector" in these claims.

Claims 4 and 11 have been amended to delete the definite article "the" from in front of the term "expression vector". These claims now specify that the fusion protein is expressed from expression vector pTYB1.

Applicants submit that claims 4 and 11 as amended are definite. Applicants respectfully request withdrawal of the rejection under 35 USC 112 second paragraph.

Rejection under 35 USC 102(b)

The Examiner rejected claims 1-3, 9 and 10 as anticipated by reference US 2001/0024789 (Kurz et al.).

The Examiner rejected the claims on the basis that the reference teaches nucleic acid-protein fusion entities that contain an N-terminal affinity tag used to immobilize the nucleic acid-protein fusion, followed by a suitable intein sequence. Once immobilized, self-cleavage is induced, and the products are released and recovered, such as by reaction with a capture molecule that has specificity for a reacted fusion molecule.

Claims 1 and 9 have been amended to clarify that the cleavable intein is an intein mutated to only undergo the first step of protein splicing. Support for the amendment can be found at least at paragraph [0037] of the application as originally filed.

Applicants respectfully submit that the claims as amended are not anticipated by Kurz et al., for at least the following reasons.

Independent claim 1 as amended recites a method of immobilizing a protein onto a support comprising (i) attaching a ligand to a fusion protein comprising a cleavable intein under condition suitable for the cleavage of the fusion protein at the intein cleavage site to release the cleavable intein from a remaining portion of the fusion protein, and attachment of the ligand to the remaining portion of the fusion protein at the newly generated terminus of the remaining portion of the fusion protein to form a protein-ligand; and (ii) immobilizing the protein-ligand onto a support that is functionalized with an affinity receptor; wherein the intein is mutated to only undergo the first step of protein splicing.

Independent claim 9 as amended recites a method of preparing a protein array comprising the steps of (i) expressing a protein as a fusion protein comprising a cleavable intein and a binding domain downstream to the intein, (ii) contacting the expressed fusion protein with a substrate to which the binding domain binds, (iii) attaching a ligand to the expressed fusion protein comprising a cleavable intein under condition suitable for the cleavage of the fusion protein at the intein cleavage site to release the cleavable intein from a remaining portion of the fusion protein, and attachment of the ligand to the remaining portion of the fusion protein at the newly generated terminus of the remaining portion of the fusion protein to form a protein-ligand, (iv) immobilizing the protein-ligand onto a support that is functionalized with an affinity receptor; wherein the intein is mutated to only undergo the first step of protein splicing.

The remaining cited claims, 2, 3 and 10 depend directly or indirectly from claims 1 and 9.

Additionally, claim 9 has been amended to clarify that the fusion protein in step (iii) is the same fusion protein referred to in steps (i) and (ii). Support for this amendment can be found at least at paragraph [0036] of the application as originally filed.

Applicants point out that the specification indicates a "cleavable intein" (as specified in the present claims) refers to a mutated intein that has been mutated to only undergo the first step of a protein splicing reaction upon addition of a suitable reagent (see paragraph [0037] of the instant application). Such mutated inteins include but are not limited to the Sce VMA mutated intein encoded by the commercially available pTYB1 vector, as disclosed in the present application.

The Kurz et al. reference does not utilize such a cleavable intein in the excerpt relied on by the Examiner. Rather, the intein used by Kurz et al. is a fully functional intein and results in a complete splicing and ligation event, ligating the two extein portions of fusion protein and fully splicing out the intein portion of the fusion protein. Thus, the Kurz et al. reference describes using a native intein to accomplish ligation of two exteins, and does not describe use of a mutated cleavable intein to generate a free end of a fusion protein for subsequent attachment of a ligand to the protein.

Nor does the Kurz et al. reference suggest the subject matter of the present claims as currently amended. That is, a skilled person, upon reading Kurz et al. and the description of using a native protein ligation event to cleave an intein and to ligate two extein portions, would not be led to a method of attaching a ligand to a protein by inducing cleavage of a cleavable intein, or to a method of using such a protein-ligand construct to produce a protein array.

Furthermore, the Kurz et al. reference does not anticipate claim 9. Claim 9 of the present application requires that the fusion protein is contacted with a substrate to which a binding domain binds, the binding domain being located downstream of the intein. The Examiner indicated that in Kurz et al. the downstream extein was analogous to the fusion protein and the upstream extein was analogous to the ligand. As can be seen in Figure 9 of Kurz et al., either the intein portion or the upstream extein (ligand) portion binds to the solid support, and thus there is no binding domain located downstream of the intein that is contacted with a substrate to which the binding domain binds, as required by claim 9 of the present application.

Thus, Applicants respectfully submit that the present claims as currently amended are not anticipated by the cited reference, and respectfully request withdrawal of the claim rejections under 35 USC 102 (b).

Rejection under 35 USC 103

The Examiner rejected claims 4-8 and 11-16 as obvious having regard to the Kurz et al. reference in view of one or more of Duan, Xu et al., Bradley et al. and Inoue et al.

Given the above arguments regarding the Kurz et al. reference, Applicants submit that the Kurz et al. reference does not anticipate or render obvious the independent claims 1 and 9 as currently amended, and that none of the additionally cited references can overcome the above-described deficiency of Kurz et al. Thus, none of the references cited under 35 USC 103 can combine with Kurz et al. to render as obvious the present claims as currently amended. Applicants respectfully request withdrawal of this rejection.

It is believed that no new matter has been added by these amendments.

In view of the foregoing, it is believed that the application is in condition for allowance. Applicants respectfully request entry of this amendment and allowance of the application.

Respectfully submitted,

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